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Response to the American Sports Fishing Association Sponsored Report and Revisions of Economic Impact Estimation for Recreation Activities

American Sports Fishing Association Report

On March 7, 2002, the American Sports Fishing Association (ASA) in cooperation with the United Anglers of Southern California released a report developed by Robert Southwick of Southwick Associates, Inc of Fernandina Beach, Florida entitled “*The Economic Effects of Sportsfishing Closures in Marine Protected Areas: The Channel Islands Example*”. The report is posted on the ASA web site (<http://www.asafishing.org>). A press conference was held in Long Beach, California at the Fred Hall Fishing Tackle and Boat Show announcing the report and its’ basic findings.

The report’s stated goal was to broaden understanding of the economic issues related to the proposed Marine Protected Areas within the Channel Islands National Marine Sanctuary. Unfortunately, the report instead applies blatantly bad science in what can only be described as “pure advocacy analysis”. The report attacks the methods employed by us in our Step 1 analysis of four marine reserve alternatives, which we had done while advising the Marine Reserve Working Group (MRWG). The MRWG was charged with developing alternatives for marine reserves in the Channel Islands National Marine Sanctuary (CINMS). The four alternatives were labeled A, B, C, and D and definitions, maps and our Step 1 analyses were posted on the CINMS web site (<http://www.cinms.noaa.gov/MRWGsocioec/panel.html>).

The report made several claims about our report, some true and some false. The most important claim was that our method underestimates the impacts of marine reserves on the local and regional economies. We show here that the opposite is true. The data and methods we employed actually overestimate the economic impacts from recreational fishing on the local and regional economy and overstate the impacts from marine reserves in the CINMS on the local and regional economy. Below we address all the issues mentioned in the ASA sponsored report.

Inclusion of Durable Good and Annual Expenses in Economic Impact Analyses. The ASA reports main criticism of our estimates of economic impact of fishing is that we did not include equipment purchases and other expenses that are not related to specific fishing trips. This would include items such as rod & reels, boats & motors, vacation homes, fishing vehicles, clothing, magazines, club dues and license fees. These are labeled “Annual Expenditures” in the report by Gentner, Price and Steinback (2001) entitled “*Marine Angler Expenditures in the Pacific Coast Region, 2000*”. This report included detailed trip expenditures by fishing mode (e.g., shore, charter/party boat and private household rental boat) and resident status (e.g., coastal residents and nonresidents). Annual expenditures were reported by resident status. Estimates were provided for the Southern California region.

The author of the ASA report divides the annual expenditures by the annual number of days of fishing and adds this to the spending per day for trip expenditures to arrive at a total spending per day. There is nothing wrong with this, if the purpose is to estimate the economic impact of the recreational fishing industry on the local or regional economy. However, ***it is not appropriate to include the annual expenditures in analyses of marginal changes in the total numbers of days of fishing caused by a change in management strategies or regulations.*** By marginal changes we mean relatively small percents of total activity, which we will show is the case for the currently proposed marine reserve alternatives in the CINMS, as well as the previous ones we analyzed for the MRWG.

Why is it not appropriate to include annual expenditures in the analysis of marine reserves? First, the decision to purchase a rod, reel, boat, motor, vacation home, fishing license, etc. is not related to the decision to fish on any given day. As Gentner, Price and Steinback (2001) mention, those that fished the most days had higher expenditures on annual expenditure items. This is expected, since a person who only fishes a couple of days a year most likely cannot justify the large expenditure required to purchase a boat, motor, fishing vehicle or vacation home. But whether a person chooses to fish on any given day doesn’t determine expenditure on annual expenditure items, such as boats and motors. So any event that changes a

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small portion of a person's total fishing activity would not be expected to have any impact on the spending on annual items.

Nobel Laureate economist, James Tobin, first developed a statistical method for estimating changes in durable good expenditures (Tobin 1958). Tobin recognized that, in any given year, only a small portion of people purchase a specific durable good. Durable goods by their nature have useful lives, often extending many years. A person doesn't purchase a boat or even a rod and reel each time they go fishing. For analyzing and predicting changes in durable good expenditures, Tobin developed what is now called the "Tobit Model" that model accounts for the fact that, in any given year, only a small portion of people will actually make a purchase. Number of days of fishing might be included as an explanatory variable of the decision to purchase equipment or other annual expenditure items, but it is most likely that days would not explain very much of the variation in the data, and would have only some small marginal impact. The assumption that one could simply divide the total annual expenditures by the annual number of days of fishing, and then apply that to a change in the number of days would prove to be terribly wrong by this analysis.

Most likely, there is some threshold on the proportion of a person's fishing days impacted which might impact the decision of whether to make a purchase of an annual expenditure item. We don't have full information on all the days spent fishing or all the days people might use their boats, vacation homes, etc., while recreating. However, we know that in 1999 CINMS charter/party boat fishing accounted for 25.7% of all the charter/party boat fishing in Southern California. In addition, we know that private household/rental boat fishing in the CINMS accounted for 21% of all the private household/rental boat fishing in Southern California. We also know the amount of activity potentially impacted by each proposed marine reserve alternative.

Let's take the Preferred Alternative as an example. The current preferred alternative for the network of marine reserves in the CINMS cover 25% of the CINMS waters. It would potentially impact 16.23% of the charter/party boat fishing and 17% of the private household/rental boat fishing. So on net, only 4.2% of all the charter/party boat fishing in Southern California is potentially impacted by the preferred alternative. Similarly, on net only 3.6% of the private household/rental boat fishing would potentially be impacted by the preferred alternative. Across both types of fishing, 3.8% of Southern California boat fishing would potentially be impacted by the preferred alternative (Table H.1). Therefore, the potential impact of the preferred alternative network of marine reserves in the CINMS has only a small marginal impact on the total days of marine recreational fishing in Southern California and would therefore would be expected to have no impact on the purchase of annual expenditure type items. Spending on these types of items would not be appropriate to include in the analysis of marine reserves in the CINMS.

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Table H.1 CINMS as a Percent of Southern California Recreational Fishing, 1999

	Number of Fishing Trips (Days)		Total Boat Fishing
	Charter/Party Boat Fishing	Private Household/Rental Boat Fishing	
S. California	617,000	1,019,000	1,636,000
CINMS	158,768	214,015	372,783
Marine Reserve Preferred Alternative	25,767	36,381	62,148
% of S. CA in CINMS	25.73	21.00	22.79
Preferred Alternative as Percent of CINMS	16.23	17.00	16.67
Preferred Alternative as Percent of S. CA	4.18	3.57	3.80

Sources: National Marine Fisheries Service, Marine Recreational Fishing Statistics Survey (NMFS-MRFSS), <http://www.st.nmfs.gov/st1> and Kolstad Survey of recreational charter/party/guide services for the CINMS.

When would it be appropriate to include annual expenditure items in an economic impact analysis? As the above discussion stated, there might be some threshold level of activity impacted that might start to impact people's decision to purchase annual expenditure items. For fishing licenses, if a certain high proportion of days were impacted and there were no substitute places to go fishing, a person might quit participating in fishing and not buy a fishing license. If they own a vacation home or a boat and motor, they may decide to sell them as well. Over the long-term, if fishing capacity is lowered by the marine reserves, this could result in some smaller number of new entrants into the fishery and thereby lower the amount of spending on new equipment and other annual expenditure items. But the majority of experiences suggest, and the most likely expected outcome is that, over the long-term, fishing capacity will be expanded by marine reserves through the replenishment of areas outside the protected areas.

Even in the short-term, the analysis would have to employ the techniques developed by Tobin (1958) to analyze how the marine reserves would possibly change the purchase of annual expenditure items. And, as discussed above, the amount of impact would be less than simply the percent of days of fishing impacted. For example, if the entire CINMS were made into a marine reserve, 25.7% of the charter/party boat fishing and 21% of the private household/rental boat fishing in southern California would be potentially impacted. This amount of impact might reach the threshold level and require analysis of the impacts on annual expenditure items. But as was pointed out, the impact would be much less than the percents of total activity impacted, since days of fishing would not be the only explanatory variable in the model explaining the decision to purchase an annual expenditure item (i.e., the Tobit Model).

Substitution. Our Step 1 analyses simply add up the activity currently taking place within the proposed marine reserve areas and apply the assumption that all is lost. No account is taken of people's ability to substitute or relocate their fishing activities to other fishing sites. Under the preferred alternative, only 25% of the CINMS waters are included in the proposed network of marine reserves leaving 75% of the CINMS plus all the areas outside the CINMS for people to find other fishing sites. Thus, we would expect that our Step 1 estimates are overestimates of impact. We don't have a model to tell us how much substitution might take place, and what the net impact will be either in the short or long term. However, some substitution is likely, and to the extent people are able to find suitable substitute fishing sites, this will lower estimates of impact that we make in our Step 1 analyses.

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The ASA report claim that we had underestimated the potential economic impact is totally driven by their inclusion of annual expenditure items in their revised estimates. As we have shown above, this is not good economics and not good science, and represents “pure advocacy analysis”.

Residency Status and the Multiplier Impacts. The author of the ASA report apparently did not understand our multiplier analysis and made claims that this was a further reason why our estimates of the impact of marine reserves were underestimates. We understand why this mistake could be made since we never published a report explaining our multiplier analysis, although we explained it to the MRWG and the public at several public meetings during the two-year MRWG process.

Actually, our multiplier analysis is related to the definition of where fishermen live relative to the place where they accessed the CINMS and spend their money locally for fishing trips. We used a range of multipliers (2.0 to 2.5 for income and 1.5 to 2.0 for employment). These multipliers are “Keynesian” type multipliers and are within the range of multipliers we would expect for counties like Santa Barbara, Ventura and Los Angeles counties, which have fairly diverse economies and would be expected to have relatively high multipliers. The range of multipliers was used to develop upper and lower bound estimates of impact. One of the reasons was that we did not have any information on where the people lived that accessed the CINMS from each county. By applying the multipliers to all fishermen spending, the assumption is that all fishermen are nonresidents of the county from which they accessed the CINMS. That means that none of the fishermen that accessed the CINMS from a Santa Barbara port live in Santa Barbara. Results will clearly be overstated because some percent are likely to be local residents. The reason for this result is that economists generally don’t apply multipliers to local spending because it double-counts local spending. Spending by local residents is part of the multiplier process from basic or export industries, which bring new dollars into the community.

Our application of the multipliers to all spending seriously overstates the economic impacts of marine reserves. It would be much more reasonable to assume that some portion of those that accessed the CINMS from Santa Barbara county ports are local residents of Santa Barbara County, and similarly for the other two counties. We used the range of multipliers to account for some of the resident status problem, however, information from the National Marine fisheries Service, Marine Recreational Fishing Statistics Survey (NMFS-MRFSS) suggests that the range of multipliers is not a big enough adjustment to account for the possible overstatement of impact.

NMFS-MRFSS data for 1999 shows that 86.71% of the Southern California marine recreational fishing trips (days) for charter/party boat fishing were made by coastal residents. For private household/rental boat fishing, the estimate was 96.86%. Coastal residency doesn’t give us precise enough information to extrapolate this to saying that those same percentages should apply to each county in the impact area. But it does indicate that our analysis overstates the impact by applying multiplier analysis to all fishermen expenditures.

We have developed two sets of estimates. One using our original assumption that 100% are nonresidents and therefore the multipliers are applied to all expenditures. The second set of estimates is based on the assumption that 50% accessed the CINMS from the county of their residence. We include only the direct sales, income and employment impacts for residents and the direct and multiplier impacts for nonresidents. Given the percentages of coastal residents for Southern California cited above, this is still likely to lead to an overestimate of impact, but our range of multipliers may now give a truer picture of the range of potential impacts. In our Step 1 analyses, we would still refer to the upper bound estimates as representing “maximum potential loss”.

Import Substitution/Double Counting Economic Impact. As stated above, in local or regional economic impact analysis, the inclusion of resident spending impact is usually not done because it is already accounted for in the multiplier analyses of basic or export industries. Nonresident fishermen that bring new dollars into a county spend money, which is received by local businesses and they spend it on inputs of production, including wages and salaries for labor and a return to the business as profit. These workers and business owners spend a portion of their incomes in the local economy and thus the ripple or multiplier

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impacts. Some of the workers and business owners that received income through this multiplier impact will spend it locally on fishing trips in the CINMS. So this portion of resident spending would be double-counted.

We recognize that by including resident spending impacts, even only the direct impacts, does involve double counting. The reason for including it has to do with the “*import substitution*” argument. Import substitution means that the multiplier impact would be reduced from all basic or export industry spending, if the fishermen would substitute to fishing sites outside the local county. The multiplier impacts would be less without this spending. Local businesses have an incentive to keep this activity in the local area. So, this is another reason that supports our calling our Step 1 analysis estimates “maximum potential loss”.

There is a gray area where resident direct impacts may not be double counting and which may not require the assumption of import substitution to count the impact. This would be the case of income earned from sources unrelated to work in the county of residence and spending. A good example is retirement and pension income. This source of income represents new dollars into the community and is thus a basic or export industry. Dollars of spending here have their own multiplier impacts that are not double counted. To the extent that local residents are spending from these sources of income for recreational fishing in the CINMS it is appropriate to include not only the direct impacts, but also the multiplier impacts of such spending.

As the above discussion indicates, our Step 1 analyses will tend to overestimate economic impacts of marine reserves on the recreational fishing community and associated industries in the local and regional economies. This is true even with our assumption of 50% local residency.

Outdated Expenditure Information. The ASA report also charged that we were using outdated expenditure information and therefore our estimates of spending and income and employment impacts were underestimated. It is true that the expenditure profiles that we used were based on a 1985 and a 1991 study. At the time we started the MRWG process in 1999, the expenditure report by the Gentner, Price and Steinback (2001) was not available. We knew the study was underway but were not aware the estimates were available to apply to the current six alternatives analyzed in this report. However, the new estimates of trip expenditures or spending per person per day are lower than those from the two older studies. This lowers our estimates of the impacts of the marine reserves even further.

Table H.2 shows the derivation of the updated spending profiles for charter/party boat and private household/rental boat fishing. Expenditures were reported by residency status (e.g., coastal residents versus nonresidents of coastal areas) in the first two columns. The third column reports the weighted average for residents and nonresidents using the year 2000 distribution between residents and nonresidents. The fourth column reports the same expenditures using the 1999 distribution of residents and nonresidents and also adjusts year 2000 dollars to 1999 dollars using the Consumer Price Index for all Urban Workers for All Items 1982-84=100. Our baseline activity estimates and impact estimates are for year 1999. As it turns out, some of our expenditures are higher for 1999 than for 2000 because the weights are higher for nonresident charter/party boat fishermen. Also, for charter/party boat fishing, we substitute our estimates of charter/party boat fees for those in the 2000 study because our estimates were based on a census, not a sample, of charter/party boat fishing in the CINMS, and our estimates vary by county. For charter/party boat fishing, our charter/party boat fees are higher for Santa Barbara and Los Angeles counties and lower for Ventura County than the 2000 study for all of Southern California (see footnote 5 of Table H.2).

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Table H.2. Updated Spending Profiles for Recreational Fishermen in S. California, 2000

Charter/Party boat				
	Residents	Non-residents	Weighted 2000 \$ ¹	Weighted 1999 \$ ²
Food	\$12.62	\$38.01	\$15.69	\$15.47
Lodging	\$1.18	\$59.55	\$8.25	\$8.65
Private transportation	\$9.78	\$65.62	\$16.54	\$16.64
Public transportation	\$0.51	\$253.90	\$31.20	\$33.07
Boat fuel	\$0.00	\$0.00	\$0.00	\$0.00
Charter/Party Fees ⁵	\$55.43	\$37.40	\$53.25	\$51.31
Access/Boat Launch Fees	\$0.96	\$2.95	\$1.20	\$1.18
Equipment Rental	\$1.81	\$34.97	\$5.83	\$6.01
Bait & Ice	\$0.27	\$2.32	\$0.52	\$0.52
Total	\$82.56	\$494.72	\$132.47	\$132.87
Private Household/Rental boat				
	Residents	Non-residents	Weighted 2000 \$ ³	Weighted 1999 \$ ⁴
Food	\$7.54	\$17.53	\$7.93	\$7.60
Lodging	\$0.52	\$23.33	\$1.42	\$1.20
Private transportation	\$7.07	\$74.87	\$9.74	\$8.90
Public transportation	\$0.03	\$61.43	\$2.45	\$1.89
Boat fuel	\$12.88	\$21.97	\$13.24	\$12.74
Charter/Party Fees	\$0.00	\$0.00	\$0.00	\$0.00
Access/Boat Launch Fees	\$1.54	\$2.37	\$1.57	\$1.52
Equipment Rental	\$0.72	\$7.71	\$1.00	\$0.91
Bait & Ice	\$6.87	\$11.02	\$7.03	\$6.77
Total	\$37.17	\$220.23	\$44.38	\$41.52

1. Weight for residents on charter/party boats for year 2000 is .8789. Non-residents is .1211.
2. Weight for residents on charter/party boats for year 1999 is .8671. Non-residents is .1329.
Consumer Price Index-All Urban Consumers-All Items 1982-84=100 was 172.2 for year 2000 and 166.6 for 1999. Conversion factor from 2000 to 1999 dollars is equal to 172.2 divided by 166.6 or 1.0336.
3. Weight for residents on private household/rental boats for year 2000 is .9606. Non-residents is 0.0394.
4. Weight for residents on private household/rental boats for year 1999 is .9686. Non-residents is 0.0314.
5. Since our effort involved a census of operators in the CINMS, we substitute the fees derived from the Kolstad survey: Santa Barbara \$60.74; Ventura \$47.62; and Los Angeles \$59.95.

Sources: Gentner, Price and Steinback (2001) for Marine Angler Expenditures.
CPI, U.S. Dept. of Labor, Bureau of Labor Statistics, <http://data.bls.gov/cgi.bin/surveymost>
1999 and 2000 Number of Trips, NMFS, <http://www.st.nmfs.gov/st1/recreational/database/queries/index.html>

Table H.3 shows the expenditure profiles we used from the two older studies. For charter/party boat fishing, the estimates ranged from \$153.35 to \$166.47 per person per day (depending on county of access) from the older studies versus \$129.18 to \$142.30 from the new updated study or about a 14.5% to 15.8% reduction in the average spending per person per day. For private household/rental boat fishing, the reduction was even greater. The older studies produced an estimate of \$71.73 per person per day. The new updated study produced an estimate of \$41.52 per person per day or a 42% reduction. Thus, incorporating the new updated information will reduce greatly the estimated impact of marine reserves on recreational fishing spending and the associated economic impact on income and employment in the local economies, not increase it as the ASA report asserts. Again, the ASA report author failed to mention this fact because it did not support their contention. They were practicing “pure advocacy analysis” and did not want to mention anything that did not support their position. This represents blatantly bad science.

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Table H.3. Old Expenditure Profiles for Recreational Fishing

Expenditure	Expenditures Per Person Per Day (1999 \$)	
	Charter/Party Boat Fishing	Private Household/ Rental Boat Fishing
Boat Fees ¹	\$47.62 - \$60.74	\$0.00
Boat Fuel	\$0.00	\$19.00
Food, Bev. & lodging	\$69.21	\$16.21
Transportation	\$14.30	\$14.30
Equipment Rental	\$22.22	\$22.22
Total	\$153.35 - \$166.47	\$71.73

1. Boat fees used were actual by county and activity from the Kolstad survey.
Charter/party boat fishing for Santa Barbara County was \$60.74, Ventura
County was \$47.62 and Los Angeles County was \$59.95.

Table H.4 shows a summary of the implications of both updating the expenditure profiles and our assumptions about residency and the use of multipliers on Step 1 level analysis of the marine reserve alternatives for the CINMS. Our original methods, as applied to MRWG alternatives A, B, C, D, E and I as found on the CINMS web site greatly overstated the potential economic impacts of the marine reserves associated with recreational fishing. Table H.4 shows an overstatement on income impact, assuming 100% nonresidents, between 16.7 % and 54.95 % and on employment of between 20 % and 52.94 % for the existing six marine reserve alternatives. For all consumptive recreation activities, the overstatement of income impacts were between 24.82% and 26.25 % and for employment between 25.80 % and 27.97 %. Using the 50% residency assumption, the income impacts were overstated by between 41.69 % and 68.47 %, and employment impacts were overstated by between 40.12 % and 64.71 %. For all consumptive recreation activities, the overstatement of income impacts were between 47.37 % and 48.37 % and employment impact between 44.44 % and 45.76 %.

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Table H.4 Impact on Step 1 Analysis of Consumptive Recreation by Including Updated Spending Profiles for Fishing and the Assumption about Percent that are Local Residents

Alternative	Activity	Percent Changes from Original Step 1 Analysis			
		100 % Nonresidents ¹		50% Residents ²	
		Income	Employment	Income	Employment
1	Consumptive Recreation	-26.25	-27.97	-48.37	-45.76
	Charter/Party Boat Fishing	-16.70	-20.27	-41.69	-40.54
	Private household/rental boat fishing	-54.95	-52.94	-68.46	-64.71
2	Consumptive Recreation	-25.37	-26.46	-47.76	-44.44
	Charter/Party Boat Fishing	-16.70	-20.59	-41.69	-40.20
	Private household/rental boat fishing	-54.95	-51.79	-68.46	-64.29
3	Consumptive Recreation	-25.30	-26.81	-47.71	-44.93
	Charter/Party Boat Fishing	-16.70	-20.00	-41.69	-40.00
	Private household/rental boat fishing	-54.95	-52.78	-68.47	-63.89
4	Consumptive Recreation	-25.17	-26.14	-47.62	-44.81
	Charter/Party Boat Fishing	-16.74	-20.42	-41.72	-40.14
	Private household/rental boat fishing	-54.95	-52.24	-68.46	-64.18
5	Consumptive Recreation	-24.82	-25.80	-47.37	-44.52
	Charter/Party Boat Fishing	-16.73	-20.37	-41.71	-40.12
	Private household/rental boat fishing	-54.95	-51.28	-68.46	-64.10
Preferred	Consumptive Recreation	-25.41	-26.21	-47.79	-44.66
	Charter/Party Boat Fishing	-16.74	-20.18	-41.72	-40.35
	Private household/rental boat fishing	-54.95	-51.67	-68.46	-63.33

1. Original Step 1 assumption was that all those that accessed the CINMS from Santa Barbara were not residents of Santa Barbara and multipliers were applied to income and employment estimates. The same is true for those that accessed the CINMS from Ventura or Los Angeles counties. Percent changes here are only for updating the spending profiles for charter/party boat fishing and private household/rental boat fishing using the year 2000 NMFS study (see Table H.2).
2. Here the assumption used is that 50 percent of all trips for all consumptive recreation activities were made by residents of the county from where they accessed the CINMS. Direct expenditures, income, and employment are counted for residents and multiplier impacts are applied to the 50 percent that are nonresidents of the county from which they accessed the CINMS.

Conclusion

On the positive side, the ASA report indirectly led to its stated goal of broadening understanding of the economic issues related to the proposed Marine Protected Areas within the Channel Islands National Marine Sanctuary. We were forced to address some issues specifically that had previously not been addressed and we were able to incorporate the latest expenditure estimates for recreational fishing, which should improve our estimates of the potential economic impact of marine reserves. This provides a better starting point for our Step 2 analyses, which take into account other factors that might increase or decrease our estimates of potential losses from Step 1 analyses. On the negative side, the ASA report was exposed for blatantly bad science and exposed the ASA for supporting “pure advocacy analysis”. In that respect, the ASA report did not serve the recreational community well.